DOCUMENT RESUME

ED 225 690 PS 013 357

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TITLE Learning Academic Skills through Play.
PUB DATE Jan 83
NOTE 38p.; Paper presented at the Annual Meeting of the Southwest Educational Research Association (Houston, TX, January 27-29, 1983).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; Comparative Analysis; *Conventional Instruction; *Kindergarten Children; *Mastery Learning; *Play; *Preschool Children; Preschool Education; Pretests Posttests

ABSTRACT

The purposes of this study are (1) to identify the relationship between play and achievement in preschool and kindergarten students and (2) to compare academic skill mastery levels between two types of school groups: play curriculum and direct teacher instruction. A total of 48 preschool and kindergarten students, half enrolled in a curriculum that stressed learning through play activities and half in a curriculum that stressed learning through direct teacher instruction, were pretested and posttested on a number of academic readiness skills using the Brigance Diagnostic Inventory of Basic Skills. Out of 14 skill sections tested, the preschool play group scored additional gains over the direct instruction group in 13 skill sections. Of 16 skill sections tested, the kindergarten play group scored additional gains over the direct instruction group in 11 skill sections. It is suggested that in order for heightened academic learning to take place, the inclusion of play in early childhood programs seems to be necessary. (Author/MP)

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LEARNING ACADEMIC SKILLS THROUGH PLAY

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"Paper presented at the annual meeting of the Southwest Educational Research Association, Houston, January 27-29, 1983."

ABSTRACT

The purposes of this study were to: (1) identify the relationship between play and academic achievement in preschool and kindergarten students and (2) compare academic skill mastery levels between two types of school groups - play curriculum and direct teacher instruction. Using the Brigance Diagnostic Inventory of Basic Skills, a study was conducted. Four classrooms (two preschool, two kindergarten), a total of forty-eight preschool and kindergarten students, were tested in a number of academic readiness skills. Half of the students were enrolled in a curriculum that stressed learning through play activities and half of the students were enrolled in a curriculum that stressed learning through direct teacher instruction.

Out of 14 skill sections tested, the preschool play group scored additional gains over the direct instruction group scores in 13 skill sections. Out of 16 skill sections tested, the kindergarten play group scored additional gains over the direct instruction group scores in 11 skill sections. On one skill section, the direct instruction group scored above the play group. On 4 skill sections both groups demonstrated the same level of master skill gain.

The data supported the premise that play has a significant influence on obtaining the mastery of academic readiness skills. In order for heightened academic learning to take place, the inclusion of play in early childhood programs seems to be a necessary ingredient.

Today the pressure for academic achievement, cognitive learning and preparation for the next grade seems to be an expression of this contemporary desire to exploit children for what is often self-defeating purposes. (Schools) ... refuse to recognize that most of the basic learning for living and social life... Must be learned through daily living. (Frank, 1968 pp. 439-440)

These words of Frank reflect the academic dilemma educators are in today. The public school system felt the push immediately after the Russian launching of Sputnik into outer space. Somehow, the public contended, the schools have failed. Soon, school curriculum would reflect learning modalities that enabled students to learn things earlier. (Shuman, 1979) The aftermath of student unrest and the post-Vietnam war era later was reflected in the "back to basics" movement.

In the 80's we are beginning to see educational funds drying up. Zero based budgeting and educational accountability are public banners. The pressures of academic excellence and fiscal management are daily challenges for today's educators. This conservative movement has taken hold of school and preschool curriculum and "play is its first victim." (Glickman, 1981)

There is something unnerving to adults when a child answers the question, "What did you do in school today?" with, "I played." Upon visiting an early childhood classroom that reflects this philosophy one may observe children in a "house" area playing dress up and "cooking dinner," some

children building with blocks, another child painting a picture, one at the sink pouring water into various containers, and some sifting sand in the sand box. One may ask, "How can these activities be a basis for reading, writing and number computation?" One observes the teacher working with individual children or observing a child and one wonders, "When does the teacher teach?"

Perhaps this uneasiness stems from a lack of understanding about play and how children learn. Play is more complex than many educators assume and as a result of this misunderstanding play and its myriad of benefits have been discounted as a learning modality. (Martin, 1978, p. 56)

In order to clarify some misconceptions concerning the benefits of play and how it relates to academic achievement in early childhood programs the following study was conducted. In this study four groups of children were tested. Two of the groups were children involved in a school program that promoted play and two of the groups were involved in a school program that stressed achievement by direct teacher instruction. The purposes of this study are: (1) to identify the relationship between play and academic achievement in preschool and kindergarten students, and (2) to compare academic skill mastery levels between two types of school groups; play curriculum and direct teacher instruction.

Related Research

In order to clarify the need for play and its positive effects upon academic achievement it is necessary to review

current literature which examines how young children learn through the benefits of play.

J. Piaget has contributed to the understanding of cognitive development. He views learning as an adaptive process. His theory reflects a constructionistic approach. In other words, a person is endowed with abilities that enable him to construct knowledge. Everything a person experiences is interpreted in the light of what one already knows. Piaget sees important meaning in the manipulation, play and behaviors of children. These activities tell a keen observer about children's intellectual development. What this means for educators is, that in order for children to learn, appropriate environmental experiences (rich in sensory materials) must be made available. In learning new "operations" children must be given the opportunity to manipulate the environment. This requires the use of concrete materials instead of symbolic representations. (Ali, 1980; Hill, 1977; Joyce and Weil, 1980; and Kamii, 1979)

In terms of academic learning, children cannot begin to comprehend what they are reading or understand the basis of mathematics unless it reflects in their existing knowledge. (Raph 1980) If educators try to accelerate learning without taking into account childrens developmental levels, they may end up with students who can decode words without comprehending and compute problems without understanding math. First learning experiences of this kind may end up frustrating and the student in turn may associate future learning with this frustration. (Shuman, 1979)

Through play children learn many things. It fulfills a wide variety of needs in a young person's cognitive and physical development. Play permits the child "to learn about learning, to form a cognitive foundation for subsequent learning ..." (Weininger, 99, p. 134)

Play develops physical, muscular skills. Through movement the child becomes involved with the world. Physical play enhances and broadens a child's interpretation of himself in relationship to the environment. In early years, "the child learns largely through exploration and discovery." (Sinclair, 1973, p. 63) Physical play develops large and small motor development and bodily balance.

Play enhances social skills. Children learn how to become a friend, establish relationships and develop a range of emotions. When children pretend and imagine to be other people in other situations they are integrating social mores, working out emotional issues of their stage and learning to communicate to others. (Bechtel, 1982; Frost and Klein, 1979, p. 14; Leeper, Skipper, and Witherspoon, 1979, p. 397; and Piers and Landau, 1982)

Cognitive development is heightened during play. Studies have shown that play enhances divergent thinking which leads to creative problem solving. (Martin, 1978, p. 51; Pepler, 1980) "Pretending represents a critical step in passing from the sensory-motor intelligence of infancy to the symbolic thinking of adulthood. As children pretend they transpose their knowledge into symbolic form ..." (Segal and Adcock, 1981, p. 30)

In a neurological study of play and the relationship to the brain S. Tipps found that play results in, "neural growth, sustained arousal and exploration." He continues by stating, "Motoric bases of meaning and of play appear to have qualities suited to the right hemisphere which processes the dynamic understanding of the world. The nominal knowledge of language depends on the phenomonel knowledge of sight, sound, touch, smell and taste. (1981, p. 24)

In the area of academics, specific readiness skills become greatly enhanced by play. During play situations children are manipulating language and discovering the rules of syntax and sentence formation. (Buescher, 1979, p. 18) A child who works hard at playing is practicing sustained attention span, the value of working through a task and working hard at play is learning how to "work hard." (Sher, 1980) According to studies conducted by Yawkey and Fox (1981), children who were placed in discovery (play) programs "yielded significantly higher scores on ... reading readiness than those in traditional programs." (p. 54)

During play the learner is an active participant using many physical and mental modalities. Indoor and outdoor play helps the learner to: identify and classify objects, sequence, observe, discriminate (visually and auditorily) and to reorganize personal schema. Through play the learner begins to understand cause and effect relationship without the pressures of coming up with "right and wrong" answers. A learner too must be able to draw conclusions and make predictions.

This can be attained when the task at hand is supplemented by concrete manipulative materials and geared to the cognitive level of the learner. All these skills act as aids that allow children to construct more complex levels of knowledge.

The review of literature and research indicates that pre-requisite skills must be learned cognitively prior to requiring children to perform abstract manipulation of symbols, namely reading, writing and enumeration. (Range, Roubinek and Layton, 1980, p. 5) An avenue of learning that facilitates cognitive development is play. According to J. Featherstone (in Silberman (Ed), 193), "play is the principal means of learning in early childhood." (p. 143) Susan Issacs as quoted by L. Weber (in Silberman, 1973) states, "Play is the child's meaning of living and of understanding life. (p. 155)

Method

Subjects. Subjects were drawn from four different classrooms. Two classes of students were kindergarten level, ages five to six and two classes of children were preschool level, ages four to five. In total, forty-eight subjects were pretested and posttested. Twelve participants were randomly selected from each class and level. From the total, twenty-eight students were girls and twenty were boys. On kindergarten level, out of the twenty-four students tested, twelve were girls and twelve boys. On the preschool level, out of the twenty-four students tested, sixteen were girls and eight were boys. All students (except one) had Spanish surnames.

The four teachers involved in the study volunteered their classes. Two of the selected teachers (one preschool, one kindergarten) emphasized readiness and academic achievement by utilizing direct teaching instruction. Students in these classes spent approximately sixty-five to seventy minutes in direct instruction situations (seatwork assignments plus teacher instruction). The students spent approximately forty to sixty minutes in self directed activities (learning centers, arts, motor development activities).

The other two teachers (one preschool, one kindergarten) emphasized learning through play activities and learning centers. Students in these classes spent upwards from seventy-five to one hundred minutes (or more) in self directed activities (centers, outdoor play, motor development activities) and approximately thirty minutes with direct teacher instruction (which includes specific seatwork assignments). All four groups of children napped from forty to sixty minutes daily. Also, all four groups displayed evidence of cooperation with each other and a general absence of behavior problems.

The teachers, when queried by the examiner, responded that they liked their jobs, enjoyed the age level of children and were happy with their situations. The teachers seemed to respect the students as evidenced by a display of calm mannerisms yet enthusiasm and using praise and positive reinforcement in controlling student behavior.

Apparatus. Sixteen areas of readiness tasks were selected

from the Brigance Diagnostic Inventory of Basic Skills. (Curriculum Associates, MA: Second Edition, 1977). This instrument is designed to assess basic readiness and academic skills. It also determines the level of achievement (mastery of a skill) or need for reinforcement of a specific skill.

The instrument used pictures and diagrams for students to identify. All the directions were given orally in a one to one interview. On four of the tasks the students were required to draw or to print on paper. Paper and pencil were provided by the examiner.

Procedure. The testing procedure consisted of two testing sessions for each student. A pretest was administered in the Fall of the school year and then the posttest was administered ten to twelve weeks later (late Winter).

The procedure of testing was a standard verbal personal interview. The examiner would request that each student respond to a battery of tasks by drawing, painting, verbalizing or printing. A description of each skill area is described below.

Color Recognition. The student, when presented with samples of eight colors and three hues in an order commonly taught, verbally and correctly names the color.

Visual Discrimination. The student distinguishes between like and unlike objects. Shown in sets of four objects, the student is asked to find the one that is different from the others. The printed symbols range from designs, letters or words. Twenty items are included in this skill.

Visual Motor Skills. When presented with six geometric designs of graduated development the student will use pencil and paper to reproduce the figures.

Body Image. When asked to draw a picture of a person and given pencil and paper, the student will demonstrate awareness of body parts by drawing a picture of a person with head, legs, eyes, nose, mouth, trunk, hands and ears.

Identification of Body Parts. The student will demonstrate the bility to identify parts of the body by touching or pointing to sixteen parts of the body including; nose, hands, eyes, teeth, mouth, head, legs, back, stomach, chin, arm, knee, shoulder, ankle, hips and heel.

Directional Words. The student is tested for understanding of directional or positional words. The examiner issues a command such as "Stand up" and the student exercises the command. Twenty directional words are used in this exercise: over, above, down, in, out, top, behind, left (2), right (2), front, back, under, beside, beneath, forward, backward, and next to.

Verbal Directions. The student is given verbal directions of increasing difficulty. The child is asked to carry out one direction, then two and finally three directions. This task covers the area of verbal memory and following verbal directions.

Articulation of Sounds. Shown a picture, the child is asked to name the picture. The test assesses only the initial sounds of words. The student should clearly articulate the

initial sounds when naming the objects.

Sentence Memory. When presented auditorily with sentences up to fourteen syllables in length, the student demonstrates an immediate auditory recall ability by correctly repeating each sentence.

Counting. The student will count by rote to ten when requested by the examiner. The student was also encouraged to count to a higher number if possible.

Numeral Recognition. When presented with numerals of ten or less, one at a time, in random order, the student correctly responds when the request "What's this numeral?" was made by the examiner.

Number Comprehension. The student is presented with numerals of ten or less, one at a time, in random order and is requested, "I want you to show me this many fingers." by the examiner.

Recognition of Upper Case Letters. The student when presented with upper case letters, one at a time, in random order is requested to name each of the twenty-six letters of the alphabet.

Writing Name. The student is requested to write his/her full name; first and last, correctly and legibly in manuscript. The student was provided with paper and pencil.

Numbers in Sequence. When presented with paper and pencil and the request, "I want you to write the numerals (numbers) from one to ten." was made, the student legibly writes the numbers without assistance.

Upper Case Letters By Dictation. When given a pencil and paper, the student correctly and legibly writes twenty-six upper case letters in manuscript when dictated in random order by the examiner.

Adjustments to the test for preschool level.

The same test was administered to the preschool students as the kindergarten students. Naturally, some adjustments had to be made in the testing procedure since preschool students perform at a lower level of achievement than kindergarten students. Adjustments in the following areas are discussed below.

Visual Discrimination. The student will be presented with fifteen tasks to analyze for discrimination instead of twenty tasks. The three letter words are omitted.

Visual Motor Skills. The student is asked to copy four geometric shapes with pencil and paper instead of six.

Body Image. The student will draw a picture of a person including: head, legs, eyes, nose, mouth, arms, and trunk.

Identification of Body Parts. The preschool student will identify all parts of the body as in the kindergarten task except for the ankle, heel and hips.

Directional Skills. The preschool student will demonstrate understanding of the following positional conepts: up, over, above, down, in, out, top, behind, left, right, front, back, under, beneath, and beside.

Sentence Memory. When presented auditorily with sentences of ten syllables in length, the preschool student will

demonstrate an immediate auditory recall ability by correctly repeating each sentence.

Writing Name. The student will correctly and legibly write his/her first name only.

Numbers in Sequence. This task has been omitted from the preschool results becasue no student was able to correctly print numbers even from one to five.

Upper Case Letters By Dictation. This skill has been omitted from the preschool results because only one student demonstarted any proficiency in this skill.

Results

The results of the study are displayed in Tables 1 through 4. In order to facilitate a clear interpretation of the tables a discussion explaining the set up and formulation will follow.

Each table represents a particular group of students as reported by the titles. The students are listed as numerals. A skill section heading is displayed at the top of every column. The numeral in parenthesis represents the number of parts included in that particular skill section.

Two numerals, which are percentage scores are included under every skill section heading. The first score represents the results of the pretest and the second score represents the results of the posttest. The scores displayed at the bottom of every skill section column report the total number of mastery level pretest and posttest scores for that specific group of students. Below these scores is displayed a numeral

that represents the status of growth for the group in that particular section.

The term mastery level means 100%. The percentage numerals in each skill section represent a consistent formula. The formula is a/b x 100% = n% with a = number of correct answers, b = total number of parts, and n = percentage product. For example, the Color Recognition section is composed of three parts, if a student receives mastery scores on two of the parts then the total score is 67% or 2/3 x 100% = 66.6% or 67%.

TABLE I

DIRECT TEACHER INSTRUCTION PRESCHOOL GROUP RESPONSES

SKILLS	Color Rec.(3)		Visual Dis.(4)		Visual Motor(4)		Body Image(2)		Body I.D.(5)		Direct Words(5)		Verbal Dir.(3)		Artic. (7)		Sent. Mem.(2)		Count (2)		Num. Rec.(2)		Numb. Comp.(2)		Recog. ABC (5)		Write Name (1)	
Responses	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Student 1	33	33	0	67	75	50	50	100	80	80	40	60	67	100	57	100	50	100	100	100	0	50	0	50	0	0	0	0
2	67	67	33	67	50	75	100	100	80	80	60	80	100	100	71	100	0	50	100	100	0	0	50	50	0	0	0	0
3	100	100	33	67	75	100	100	100	100	80	60	80	100	100	57	71	100	100	100	100	50	100	50	100	0	20	100	100
4	67	33	67	67	75	75	50	100	80	80	40	60	100	100	100	100	50	100	100	100	100	100	100	100	100	100	100	100
5	67	67	37	67	25	50	50	50	80	80	60	80	67	67	57	100	50	50	0	50	0	50	0	50	0	0	0	0
6	100	100	0	67	75	75	0	50	100	100	60	80	100	100	71	71	100	100	100	100	50	50	50	50	0	40	0	0
7	33	100	0	67	50	50	50	50	100	100	40	60	67	67	57	57	0	50	100	100	50	50	50	50	0	0	0	0
8	67	67	0	67	75	75	50	50	100	100	40	60	67	67	86	100	100	100	100	100	50	100	50	50	0	0	0	0
9	67	67	67	67	0	50	0	50	60	80	60	60	67	100	57	57	0	0	0	100	0	50	50	50	0	0	0	0
10	33	33	0	100	75	75	50	50	60	60	40	60	100	100	86	100	0	50	100	100	0	50	0	50	0	0	0	100
11	67	67	67	100	75	75	50	50	100	100	80	100	67	67	100	100	100	100	100	100	100	100	100	100	100	100	100	100
12	67	67	67	100	75	100	50	50	100	100	100	100	100	100	71	100	100	100	100	100	50	50	50	50	0	0	0	0
Totals Mastery	2	3	0	3	0	2	2	4	6	5	1	2	6	8	2	7	5	7	10	11	2	4	2	3	2	2	3	3
Growth	+1		+3		+2		+2		-1		+1		+2		+5		+2		+1		+2		+1		0		0	

TABLE 2

PLAY CURRICULUM PRESCHOOL GROUP RESPONSES

SKILLS	Color Rec.(3)		Visual Dis.(4)		Visual Motor(4)		Body Image(2)		Body I.D.(5)		Direct Words(5)		Verbal Dir.(3)		Artic. (7)		Sent. Mem.(2)		Count (2)		Num. Rec.(2)		Numb. Comp.(2)		Rec. ABC (5)		Write Name(1)	
Responses	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Student 1	33	100	0	67	75	100	100	100	60	100	40	60	67	67	86	100	0	50	100	100	100	100	50	100	0	20	0	0
2	100	100	67	100	75	75	100	100	80	100	80	80	67	100	100	100	100	100	100	100	100	100	100	100	80	100	100	100
3	33	100	0	100	50	75	50	100	80	100	40	80	100	100	71	100	50	100	100	100	50	100	50	100	0	0	0	0
4	100	100	0	100	50	75	50	100	60	100	80	80	67	100	71	100	50	50	100	100	100	100	50	50	0	0	0	0
5	0	67	0	67	25	25	50	50	60	100	60	100	67	100	57	71	0	50	0	100	0	50	0	50	0	0	0	0
6	67	100	0	67	100	100	100	100	80	100	100	100	67	100	71	100	100	100	100	100	0	100	0	100	0	100	0	0
7	67	100	0	100	50	100	50	100	80	100	80	100	33	100	71	100	100	100	100	100	100	100	50	100	20	100	0	100
8	100	100	100	100	100	100	100	100	80	100	100	100	100	100	86	100	100	100	100	100	50	50	50	50	0	0	0	0
9	100	100	100	100	75	75	100	100	100	100	100	100	100	100	100	100	50	100	100	100	100	100	100	100	60	100	0	0
10	100	100	100	100	75	100	100	100	100	100	80	80	67	67	100	100	50	100	100	100	50	100	50	50	0	40	0	0
11	67	67	67	100	75	100	100	100	80	80	40	80	100	100	86	86	50	100	100	100	0	50	0	100	0	40	0	100
12	100	100	33	100	50	75	100	100	60	100	80	100	33	100	71	100	50	100	100	100	0	100	0	100	0	0	0	0
Totals Mastery	6	10	3	9	2	6	8	12	1	11	3	6	4	10	3	10	4	9	11	12	5	9	2	8	0	4	1	3
Growth	+4		+6		+4		+4		+10		+3		+6		+7		+5		+1		+4		+6		+4		+2	

TABLE 3

DIRECT TEACHER INSTRUCTION KINDERGARTEN RESPONSES

SKILLS	Color Rec.(3)		Visual Dis.(5)		Visual Motor(6)		Body Image(3)		Body I.D.(6)		Direct Words(6)		Verbal Dir.(3)		Artic. (7)		Sent Mem.(3)		Count (2)		Num. Rec.(2)		Numb. Comp.(2)		Rec. ABC(5)		Write Name(2)		Write Num.(2)		Write ABC(3)	
Responses	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Student 1	100	100	50	100	100	100	67	67	83	83	67	67	100	100	71	86	33	67	100	100	100	100	50	100	80	100	100	100	100	100	100	100
2	100	100	50	75	57	57	33	33	50	83	50	50	100	100	100	100	33	67	100	100	100	100	100	100	60	100	50	50	50	50	0	33
3	67	67	50	75	42	57	33	33	50	67	50	50	100	100	86	86	33	33	100	100	100	100	50	100	0	40	50	50	50	50	0	0
4	33	67	75	75	42	100	67	67	50	67	67	100	100	100	86	100	67	67	100	100	50	50	100	100	0	20	50	50	0	0	0	0
5	100	100	75	75	100	100	67	67	67	83	50	50	67	100	86	100	67	67	100	100	100	100	100	100	0	60	50	50	50	50	0	33
6	100	100	50	75	100	100	67	67	50	67	67	67	100	100	100	100	100	100	100	100	100	100	50	100	0	20	50	100	100	100	0	0
7	33	67	50	50	100	100	67	100	67	83	33	50	67	67	100	100	33	33	100	100	50	100	50	50	0	0	50	50	50	50	0	0
8	100	67	75	75	57	57	67	67	67	83	33	67	100	100	100	100	33	33	100	100	50	50	50	50	0	40	50	50	50	100	0	67
9	100	100	75	75	100	100	67	67	67	83	100	100	100	100	86	100	100	100	100	100	100	100	100	100	100	100	0	50	0	50	100	100
10	100	100	100	100	57	57	67	67	67	83	67	100	100	100	100	100	67	100	100	100	100	100	100	100	100	100	50	50	50	100	67	67
11	100	100	25	50	100	100	33	33	67	67	50	50	67	67	100	100	67	67	100	100	100	100	100	100	20	20	100	100	50	50	0	0
12	67	100	50	75	57	57	67	100	67	83	50	67	100	100	86	100	33	67	100	100	50	100	50	50	20	60	100	100	50	50	0	0
Totals Mastery	8	8	1	1	6	7	0	2	0	0	0	3	9	10	6	10	2	3	12	12	8	10	6	9	2	4	3	4	2	4	2	2
Growth	0		0		+1		+2		0		+3		+1		+4		+1		0		+2		+3		+2		+1		+2		0	

TABLE 4

PLAY CURRICULUM KINDERGARTEN GROUP RESPONSES

SKILLS	Color Rec.(3)		Visual Dis.(5)		Visual Motor(6)		Body Image(3)		Body I.D.(6)		Direct Words(6)		Verbal Dir.(3)		Artic. (7)		Sent Mem.(3)		Count (2)		Num. Rec.(2)		Numb. Comp.(2)		Rec. ABC(2)		Write Name(3)		Write Numb.(2)		Write ABC(3)	
Responses	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Student 1	100	100	50	100	17	83	67	67	67	100	50	100	67	100	100	100	100	100	100	100	0	100	50	100	0	100	0	100	0	50	0	67
2	100	100	75	75	67	83	100	67	67	83	50	100	100	100	100	100	67	100	100	100	50	100	50	100	0	20	50	100	0	50	0	0
3	100	100	75	100	50	50	67	67	83	83	100	100	100	100	86	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
4	0	66	0	75	50	67	33	67	50	50	33	83	67	100	42	86	0	33	100	100	50	100	50	100	0	0	0	50	0	50	0	33
5	100	100	75	100	83	100	67	100	50	100	67	100	67	100	100	100	67	100	100	100	100	100	100	100	0	60	50	50	100	100	0	33
6	0	100	25	75	50	83	33	100	50	100	67	100	100	100	86	100	67	100	100	100	50	100	50	100	0	60	0	50	0	50	0	33
7	0	100	7	75	83	100	100	100	50	83	100	100	100	100	86	100	67	100	100	100	0	100	50	100	0	40	0	50	0	50	0	67
8	33	100	50	75	50	83	100	67	67	100	67	100	67	100	71	100	67	100	100	100	50	100	50	100	0	20	50	100	0	100	0	0
9	100	100	50	100	67	100	100	100	50	100	100	100	100	100	86	86	100	100	100	100	100	100	50	100	20	60	0	50	100	100	0	33
10	100	100	0	75	33	100	67	67	83	83	83	100	100	100	100	100	33	67	100	100	100	100	100	100	0	40	50	50	0	50	0	0
11	0	100	100	100	50	83	100	100	83	100	83	100	100	100	100	100	67	100	100	100	100	100	100	100	60	100	50	100	50	100	100	100
12	100	100	50	75	50	100	67	100	67	100	83	100	100	100	100	100	67	100	100	100	100	100	50	100	0	20	0	50	0	100	0	0
Totals Mastery	7	11	1	5	0	5	5	6	0	7	3	11	8	12	6	7	3	10	12	12	6	12	4	12	1	3	1	5	3	6	2	2
Growth	+4		+4		+5		+1		+7		+8		+4		+1		+7		0		+6		+8		+2		+4		+3		0	

Color Recognition. Table 1 reports two students mastered the pretest and three students mastered the posttest showing an increase of one student. Table 2 reports six students mastered the pretest and ten students mastered the posttest showing an increase of four students. When comparing the two preschool group scores, the play group shows an increase of two more students that attained skill mastery than the direct instruction group.

Table 3 indicates eight students mastered the pretest and eight students mastered the posttest showing no increase. Table 4 indicates seven students mastered the pretest and eleven students mastered the posttest showing an increase of four students. Comparing the growth scores of the kindergarten groups, the play group shows an increase of four more students that attained skill mastery than the direct instruction group.

Visual Discrimination. Table 1 shows zero students mastered the pretest and three students mastered the posttest showing an increase of three students. Table 2 shows three students mastered the pretest and nine students mastered the posttest showing an increase of six students. Comparing the posttest scores of the preschool group, the play group displayed a growth increase of three students more than the direct instruction group.

Table 3 indicates one student mastered the pretest and one student mastered the posttest showing no increase. Table 4 shows one student mastered the pretest and five students mastered the posttest showing an increase of four students.

When comparing the growth scores of the kindergarten groups, the play groups show an increase of four more students that attained skill mastery than the direct instruction group.

Visual Motor Skills. Table 1 reports zero students mastered the pretest and two students mastered the posttest showing an increase of two students. Table 2 shows two students mastered the pretest and six students mastered the posttest showing an increase of four students. When comparing the preschool groups' scores, the play group showed an increase of two more students displaying mastery of the skill than the direct instruction group.

Table 3 reports six students mastered the pretest and seven students mastered the posttest showing an increase of one student. Table 4 reports zero students mastered the pretest and five students mastered the posttest showing a gain by five students. Comparing the results of the kindergarten scores, the play group showed an increase of four students gaining mastery level.

Body Image. Table 1 indicates two students gained mastery of the pretest and four students mastered the posttest showing an increase of two students. Table 2 indicates eight students mastered the pretest and twelve students mastered the posttest showing an increase by four students. Comparing the preschool results indicate that the play group showed an increase by two more students than the direct instruction group.

Table 3 reports zero students gained mastery on the pre-

test and two students mastered the posttest showing an increase by two students. Table 4 shows five students mastered the pretest and six students mastered the posttest showing an increase by one student. Comparing the kindergarten posttest scores, the direct instruction group showed increase in mastery by one more student than the play group posttest scores.

Identification of Body Parts. Table 1 reports six students mastered the pretest and five students mastered the posttest showing a decrease in mastery growth by one student. Table 2 displays one student mastered the pretest and eleven students mastered the posttest showing an increase in mastery growth by ten students. Comparing the preschool results shows that the play group increased mastery level by ten more students than the direct instruction group.

Table 3 shows zero students mastered the pretest and zero students mastered the posttest so no increase is reported. Table 4 indicates zero students mastered the pretest and seven students mastered the posttest showing an increase in mastery growth by seven students. Comparing the kindergarten scores indicate that the play group scores increased by seven students more than the direct instruction group.

Directional Words. Table 1 reports one student mastered the pretest and two students mastered the posttest showing an increase by one student in the mastery level. Table 2 indicates three students mastered the pretest and six students mastered the posttest resulting in mastery level gain by three more students. Comparing the preschool scores,

the results show that the play group student growth increased by two more students than the direct instruction group.

Table 3 displays zero students mastered the pretest and three students mastered the posttest showing an increase by three students. Table 4 indicates three students mastered the pretest and eleven students mastered the posttest showing a gain by eight students. Comparing the kindergarten scores, the play group scores increased by five more students than the direct instruction group.

Verbal Directions. Table 1 reports six students mastered the pretest and eight students mastered the posttest showing a gain in mastery growth by two students. Table 2 indicates four students mastered the pretest and ten students mastered the posttest showing an increase by six students. Comparing the preschool test scores indicate the play group mastery growth level increased by four more than the direct instruction group.

Table 3 indicates nine students mastered the pretest and ten students mastered the posttest showing an increase in mastery by one student. Table 4 reports eight students mastered the pretest and twelve students mastered the posttest indicating a growth in mastery by four students. The kindergarten play group scores indicate that three more students gained mastery than the direct instruction group.

Articulation of Sounds. Table 1 shows two students mastered the pretest and seven students mastered the posttest

demonstrating an increase by five students. Table 2 displays three students mastered the pretest and ten students mastered the posttest demonstrating an increase by seven students. The increase of the preschool play group reports two more students mastered skill level than the direct instruction group.

Table 3 shows six students mastered the pretest and ten students mastered the posttest indicating an increase by four students. Table 4 reports six students mastered the pretest and ten students mastered the posttest indicating an increase in growth by four students. Comparison of the kindergarten scores show no difference in mastery level gain. Both groups increased by the same number of students.

Sentence Memory. Table 1 shows five students mastered the pretest and seven students mastered the posttest showing a gain by two students in mastery level growth. Table 2 reports four students mastered the pretest and nine students mastered the posttest showing an increase in mastery level by five students. Comparing the two preschool results the play group score indicates that three students more than the direct instruction group demonstrated mastery on this skill level.

Table 3 indicates two students mastered the pretest and three students mastered the posttest indicating a gain by one student. Table 4 shows three students mastered the pretest and ten students mastered the posttest indicating a gain in mastery by seven students. The kindergarten play group scores

demonstrate six more students gained skill mastery than the direct instruction group.

Counting by Rote. Table 1 reports ten students mastered the pretest and eleven students mastered the posttest showing a gain of one student. Table 2 reports eleven students mastered the pretest and twelve students mastered the posttest showing an increase by one student. The results indicate that both preschool groups scored the same gains.

Table 3 reports twelve mastered the pretest and twelve mastered the posttest showing no growth. Table 4 shows twelve mastered the pretest and twelve mastered the posttest, again, showing no gain. The results show that both kindergarten groups, although showing no gain in growth, had already mastered this skill before the pretest was given.

Numeral Recognition. Table 1 reports two students mastered the pretest and four students mastered the posttest showing a gain by two students. Table 2 indicates five students mastered the pretest and nine students mastered the posttest showing an increase by four students. Comparing the preschool results, the play group showed an increase in mastery by two students more than the direct instruction group.

Table 3 reports eight students mastered the pretest and ten students mastered the posttest a gain by two students. Table 4 indicates six students mastered the pretest and twelve students mastered the posttest indicating an increase in mastery by six students. Comparing the kindergarten group results, the play group score increased the direct instruction

group score by four students more on the mastery level.

Number Comprehension. Table 1 shows two students mastered the pretest and three students mastered the posttest showing an increase in mastery by one student. Table 2 indicates two students mastered the pretest and eight students mastered the posttest showing an increase by six students. Comparing the preschool results, the play group showed an increase in mastery by five students more than the direct instruction group.

Table 3 reports six students mastered the pretest and nine students mastered the posttest indicating an increase in mastery growth by three students. Table 4 displays four students mastered the pretest and twelve students mastered the posttest showing an increase in mastery level growth by eight students. When comparing the kindergarten group results, the play group scores showed an increase by five students more than the direct instruction group in skill mastery.

Recognition of Upper Case Letters. Table 1 reports two students mastered the pretest and two students mastered the posttest showing no gain in mastery levels. Table 2 indicates zero students mastered the pretest and four students mastered the posttest indicating an increase by four students of mastery level. Comparing the scores of the preschool group, the play group scores indicate mastery by four more students than the direct instruction group.

Table 3 reports two students mastered the pretest and four students mastered the posttest indicating an increase by

two students. Table 4 shows one student mastered the pretest and three students mastered the posttest indicating an increase in growth in mastery level by two students. Since both kindergarten group score results were the same, no one group showed a gain over the other.

Write Name. Table 1 reports three students mastered the pretest and three students mastered the posttest showing no increase in mastery gain. Table 2 displays one student mastered the pretest and three students mastered the posttest showing an increase by two students. Comparing the preschool scores shows the play group made a gain of two students demonstrating mastery in this skill more than the direct instruction group.

Table 3 indicates three students mastered the pretest and four students mastered the posttest showing an increase by one student. Table 4 reports one student mastered the pretest and five students mastered the posttest showing an increase by four students. Comparing the kindergarten scores, the play group showed a gain by three students more than the scores of the direct instruction group.

Write Numbers in Sequence. The preschool groups are omitted for this skill section because no student achieved mastery level.

Table 3 indicates two students mastered the pretest and four students mastered the posttest showing an increase by two students. Table 4 indicates three students mastered the pretest and six students mastered the posttest showing an

increase by three students. Comparing the kindergarten results, the play group growth increased by one student more than the direct instruction group in attaining mastery level in this skill.

Upper Case Letters by Dictation. Preschool scores are omitted for this skill section because only one student (in the play group) mastered this skill.

Table 3 reports two students mastered the pretest and two students mastered the posttest registering no gains in mastery level growth. Table 4 indicates two students mastered the pretest and two students mastered the posttest registering no gain in mastery level growth. Comparing the kindergarten score results, both groups scored the same thereby indicating no mastery level growth for either group.

Total Results

Reviewing the scores of the 14 skill sections, all the preschool group scores reflected mastery level attainment. The play group scored additional growth gains over and above the direct instruction group scores in 13 skill sections. On one skill section both groups measured equal amounts of mastery level growth.

Analyzing the scores of the 16 skill sections, all the kindergarten group scores reflected mastery level attainment (except one, see fifth section, Table 3). The play group scored additional growth gains over and above the direct instruction group scores in 11 skill sections. On one skill section the direct instruction group scored over and above

the gains of the play group. On 4 skill sections the play group and the direct instruction group demonstrated the same level of mastery gain.

Discussion and Recommendations

The purposes of this study were to: (1) identify the relationship between play and academic achievement in preschool and kindergarten students and (2) compare academic skill mastery levels between two types of school groups- play curriculum and direct teacher instruction. To obtain information about these issues a study was conducted. A total of forty-eight preschool and kindergarten students were tested in a number of academic readiness skills. Half of the students were enrolled in curriculum that stressed learning through play activities and half of the students were involved in a curriculum that stressed learning through direct teacher instruction.

The data reported above would support the premise that play has a significant influence on learning the mastery of academic readiness skills. There seems to be a direct relationship between play and learning in preschool and kindergarten children enrolled in a school curriculum that stresses learning through play activities.

The results indicated that the students involved in both curricula benefitted by increase levels of academic learning but in order for heightened academic learning to take place, the inclusion of play in early childhood programs seems to be a necessary ingredient.

This study sampled a small population of students, therefore, only inferences and recommendations can be made. Hopefully, other early childhood educators will take it upon themselves to continue researching the area of play and its positive effects upon learning.

Play is a flexible learning tool. It fulfills a variety of children's cognitive, physical and affective needs. Play can easily be utilized in every childhood program. The writer recommends that large blocks of time be set aside daily to allow students to play. Learning centers can cover a broad range of interests and activities.

Children are "masters" of play. It is the responsibility of educators to capitalize upon this strength by enhancing cognitive development through play activities. Children learn by practicing, exploring and manipulating the environment surrounding them. What better way to incorporate these elements into an early childhood program than through play.

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